


DRAFT WORK PRODUCT





**Borrego Valley Groundwater Basin
Borrego Springs Subbasin
Municipal Allocations**

Projects and Management Actions

Project #2:
Water Conservation and Efficiency

Save Our Water





March 29th, 2018

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As per Agenda Packet Item II.C: Technical and Policy Issues this part of the presentation provides details pertaining to Projects and Management Actions Project #2 Water Conservation and Efficiency.

Projects and Management Actions

Project #2: Water Conservation and Efficiency

■ Potential Water Savings & Cost

- Preliminary, high level examples based on historical water usage and practices
- Each potential project will be evaluated by cost, benefit, and feasibility
- Conservation measures could easily amount to 25% of the estimated sustainable yield of the Borrego Springs Subbasin

Sector:	Potential Savings:	Approximate Cost: (per AFY/over 25 years)
Agriculture (Irrigation Efficiency)	264 AFY	\$382
Municipal (Outdoor)	315 AFY	\$339
Municipal (Indoor)	84 AFY	Variable
Recreation (Golf Courses)	674 AFY	\$128 - \$329
Total	1,337 AFY	\$128 - \$382

A preliminary estimate of the water savings potential for a water conservation and efficiency program was evaluated. The total preliminary potential estimated water savings is 1,337 acre-feet per year (AFY). The Water Conservation and Efficiency Project is interrelated to other Project and Management Actions that could result in different actual potential water savings (e.g. greater following of Ag could result in less potential to implement an efficiency program). Additionally, the current actual irrigation efficiency for each sector is unknown and assumed conditions are based on previous studies, historical conservation programs and typical savings for projects implemented in other areas of the State or in desert basins.

The table provides a summary of estimated potential savings by sector and approximate cost per acre-foot of water per year over 25 years.

For example, the potential municipal outdoor water savings assumes 25% conservation of outdoor water use and the District's current annual groundwater production of 1,678 AFY with 75% of the annual groundwater production used outdoors. Potential for savings at HOAs is a significant part of this savings and is evaluated further in Slide 7 of this presentation.

For cost comparison to other conservation measures: Mann Ag following AFY cost = \$101 over 25 years (For old citrus acreage. \$13,130,000 and 5,183 AFY water savings). Current cost for BWD water = \$1,640/AF retail cost for residential (includes fixed charges and application of tier 1 and tier 2 rates). These potential projects are economically viable.

Projects and Management Actions

Project #2: Water Conservation and Efficiency

■ Benefits of Comprehensive Conservation Program

- Reduction of water use and ensured water reliability and affordability
- Consistency with California Water Policy
- Increased awareness of a critical resource
- Customer participation and ownership
- District commitment to efficient water use and Subbasin management
- Municipal and recreational water use will be an increasingly larger percentage of overall water use as sustainability measures are implemented **DUDEK**

Notwithstanding the relaxing of state-wide emergency drought-related water requirements, Pending legislation such as (AB 869) would require long-term standards for urban water conservation. For example, SBX7-7 requires per capita urban water use reduction of 20% by 2020. BWD is exempt from the requirement but would benefit from compliance. Similarly, AB 1654 would enact legislation to make conservation a way of life in California.

Projects and Management Actions

Project #2: Water Conservation and Efficiency

■ Existing and Historical Conservation Programs

- Incentivized water rate structure
- Rebate Programs for water fixtures and appliances
- Turf replacement with xeriscape (limited implementation)



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The District has an exiting water conservation program that has focused on rebates and water audits. Additionally, the tiered structure is meant to financially incentivize conservation and end use efficiency. Evaluation of potential for additional conservation, particularly in the municipal sector, will require a survey of existing water efficiency measures, and prioritization of new programs and funding sources. This project is determine to be economically viable and requires further study.

Projects and Management Actions

Project #2: Water Conservation and Efficiency

Water Savings Potential by Sector



Agriculture



Municipal



Recreation

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The water savings potential by sector is reviewed in the following slides for agriculture, municipal and recreation.

Projects and Management Actions

Project #2: Water Conservation and Efficiency

■ Agricultural Sector

- Modification of Irrigation systems and operations
- Crop types
- Irrigation Audits – Report with recommendations
 - Potential Water Savings: Dependent on extent of utilization and degree of implementation
 - Possible Funding Sources: RCD, grants, land owner
- Potential Savings (for citrus only)
 - 264 AFY
 - \$382/AFY over 25 years



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Irrigation Audits should be conducted by grant funded agencies such as the Resource Conservation Districts (RCDs), the U.S. Department of Agriculture (USDA), National Resources Conservation Service (NRCS), University agricultural programs, or other agencies with variable funding opportunities.

The GSA will seek an expert “partner” to implement Agricultural Sector programs.

The first step is to document historical irrigation audits and existing use of water efficiency systems such as drip and micro-spray systems at field scale. For example, a 2003 irrigation survey by AAWARE covering 3,395 acres (88% of irrigated acreage) indicated that about 85% of the irrigation was drip/micro spray with 15% using sprinkler or flood irrigation (Mills 2003).

The next step is to complete updated irrigation audits and determine additional Best Management Practices (BMPs) to implement at field scale by farm.

The potential agricultural water savings and amortized cost per AFY over 25 years were taken from the Mann Study and are for citrus crops only. Mann estimated in 2014 that two thirds of the agriculture in the Basin was citrus. Additional investigation is required to determine potential water savings for other crop types. Water savings related to altering crop types is not estimated as part of the conservation and efficiency management action.

This project is likely economically viable and should be evaluated further.

Projects and Management Actions

Project #2: Water Conservation and Efficiency

■ Municipal Sector (Outdoor)

- 75% of water use is outdoors
- Potential programs:
 - HOA Landscape Reductions
 - Potential water savings: 66 AFY
 - Approximate cost of water saved: \$339/AF over 25 years
 - HOA Irrigation Efficiency Improvements
 - Potential water savings: 26 AFY
 - Approximate cost water saved: \$1,200/AFY over 25 years



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The potential municipal outdoor water savings is estimated to be 315 AFY at a cost of \$339 over 25 years. HOA landscaping opportunities represent approximately 92 AFY (approximately 1/3) of that total potential municipal outdoor water savings. HOA landscape reduction and irrigation efficiency improvement opportunities and costs were estimated in the 2014 Mann study. Funding and rebate opportunities and incentives will be investigated as part of this program. The HOA landscape reductions is economically viable and should be further evaluated.

Projects and Management Actions


Project #2: Water Conservation and Efficiency

- **Municipal Sector (Outdoors)**
75% of water use is outdoors
 - Other programs
 - Landscape Irrigation Audits
 - Smart Irrigation Controllers
 - Landscape Watering Calculator
 - Watering Index






ADJUST SPRINKLER
HEADS
& FIX LEAKS




INSTALL DRIP
IRRIGATION
& ADD A SMART
CONTROLLER



REIMAGINE YOUR
YARD



DROUGHT RESISTANT
TREES & PLANTS



USE MULCH

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There are many opportunities for out of doors water savings. According to the Save Our Water website created by the Association of California Water Agencies (ACWA) and the State Department of Water Resources (DWR), Californian's on average could save 30 to 60 gallons per watering by planting xeriscape and greater than 24 gallons per day by installing drip irrigation and smart controllers. Mulch can save 20 to 30 gallons per 1,000 square feet of landscaping for each watering.

Landscape irrigation audits are particularly beneficial for large landscapes such as those for commercial buildings and large residences. Such audits evaluate and make recommendations for irrigation methods, scheduling, and uniformity based on soils, plant types, and topography. Much like agricultural audits, funding may come from Resource Conservation Districts (RCDs), university programs, or other agencies with various funding opportunities.

Other conservation tools to consider are use of Smart Irrigation Controllers that utilize data from real-time weather stations to automatically adjust watering schedules and amounts, and a Landscape Watering Calculator, which is a web tool that provides a watering schedule that is specific to a particular user's zip code, plant types (i.e. cold season grasses, native shrubs, etc.), soil type, and watering system (i.e. drip, sprinkler, or bubbler).

The Municipal outdoor conservation program is economically viable and should be further evaluated.

Projects and Management Actions

Project #2: Water Conservation and Efficiency

- **Municipal Sector (Indoor) 20% of water use is indoors**



FIX LEAKS



INSTALL AERATORS



WASH FULL LOADS OF CLOTHES & DISHES



TURN OFF WATER WHEN BRUSHING TEETH OR SHAVING



INSTALL A HIGH-EFFICIENCY TOILET
- **Greywater Systems**
 - Potential water savings: 40 gallons/person/day
 - 30% less fresh water used on landscape







Recent relaxing of State plumbing codes have facilitated the ease of greywater utilization from showers, clothes washers, and wash basins. Where installed, such systems may provide significant water savings for outdoor irrigation. Pending legislation (AB 2042) provides incentives to single and multi-family homeowners to purchase and install greywater systems. The simplest system may cost \$30 for a valve to divert water to landscape as needed with potential for 30% savings in freshwater for landscaping.

Installation of high efficiency toilets can save about 19 gallons per person per day. Aerators save about 1.2 gallons per person per day and turning off the water while brushing teeth or shaving can save 10 gallons per person per day (Saveourwater.com). Programs specific to indoor water savings may include shower head exchange, indoor water audits, and rebate programs for low water use toilets, clothes washers, and water heaters. The potential for indoor water savings for the District is related to the extent to which past incentive programs have been implemented and a survey of existing conservation measures should be conducted as part of indoor conservation implementation.

Dudek recommends a survey of indoor conservation performed to date including a determination of rebates issued over the last 10 years to estimate the potential for additional indoor savings. Continued funding of rebates for an indoor conservation program is economically viable. BWD should also consider working with the local schools to provide an education program.

Projects and Management Actions

Project #2: Water Conservation and Efficiency

■ Recreational Sector

- Main Potential is for golf courses
- Potential Program:
 - Conversion of turf to native landscaping
 - Potential water savings: 471 AFY
 - Approximate cost of water saved: \$128/AF over 25 years
 - Irrigation System Management
 - Potential water savings: 203 AFY
 - Approximate cost: \$329AFY over 25 years



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For recreation, potential savings assumes conversion of irrigated golf course turf to native landscaping and irrigation system management. Ninety acres of turf, 17% of which is converted to native landscaping is assumed for each 18 holes. (Savings and cost estimates modified from the 2014 Mann Study). Implementation of these projects would require collaboration with each golf course to assess potential acreage for turf conversion, existing water efficiency measures, and potential for irrigation efficiency improvements. Grant related funding or rebate programs may be available. Recreation sector conservation project is economically viable and should be evaluated further for each golf course.

Projects and Management Actions

Project #2: Water Conservation and Efficiency

■ Other Conservation Actions

- Dedicated Conservation Coordinator
- Conservation Webpage
- California Water Efficiency Partnership
- School Education Programs
- Materials provided In Spanish



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Conservation Coordinator – A staff position that is responsible for pursuing, coordinating and publicizing water conservation efforts and opportunities. Such an individual can effectively leverage and coordinate a number of conservation tools and programs to maximize efficiency and minimize costs.

Conservation Webpage – One of the most effective and inexpensive methods to provide user access to water conservation information and programs. A dedicated webpage provides water user access to a variety of tools and information related to conservation. A webpage specific to the Borrego Springs community may be created and maintained as a high school project, similar to that prepared for the District's general website.

The California Water Efficiency Partnership – The California Water Efficiency Partnership (CWEP) is an organization that provides collaboration and education on water conservation and efficiency issues and provides members with resources including Best Management Practices (BMPs), educational tools, funding opportunities, and product information.

School Educational Programs – Educational programs are very effective in reducing water use in all sectors. Children have been found to effectively reduce their own water use and those of their parents. Educational programs utilized in parts of California include production of water conservation curricula for teachers, water conservation video contests for high school students, and area specific water education videos. Water conservation education typically targets kindergarten through high school ages and should

include bilingual materials in Spanish for schools within the Subbasin. Previously developed educational materials are typically available free of charge.